



Supplement of

Emissions of nitrogen oxides from US urban areas: estimation from Ozone Monitoring Instrument retrievals for 2005–2014

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Table S1. Counties grouped to determine the bottom-up NO_x emissions for each urban area.

Urban area	County (State)
Atlanta	Clayton (GA), Cobb (GA), DeKalb (GA), Fulton (GA), Gwinnett (GA), Henry (GA), Rockdale (GA)
Boston	Essex (MA), Middlesex (MA), Norfolk (MA), Plymouth (MA), Suffolk (MA)
Charlotte	Mecklenburg (NC)
Chicago	Cook (IL), DuPage (IL), Lake (IL), Will (IL), Lake (IN), Porter (IN)
Cincinnati	Boone (KY), Campbell (KY), Kenton (KY), Butler (OH), Hamilton (OH)
Dallas	Collin (TX), Dallas (TX), Denton (TX), Tarrant (TX)
Denver	Adams (CO), Arapahoe (CO), Boulder (CO), Broomfield (CO), Denver (CO), Douglas (CO), Jefferson (CO)
Detroit	Macomb (MI), Monroe (MI), Oakland (MI), St. Clair (MI), Wayne (MI), Lucas (OH)
El Paso	El Paso (TX)
Houston	Harris (TX)
Indianapolis	Marion (IN)
Jacksonville	Duval (FL)
Kansas City	Johnson (KS), Wyandotte (KS), Clay (MO), Jackson (MO), Platte (MO)
Las Vegas	Clark (NV)
Los Angeles	Los Angeles (CA), Orange (CA), Riverside (CA), San Bernardino (CA)
Louisville	Clark (IN), Floyd (IN), Jefferson (KY)
Memphis	Shelby (TN)
Miami	Broward (FL), Miami-Dade (FL)
Minneapolis	Anoka (MN), Dakota (MN), Hennepin (MN), Ramsey (MN), Washington (MN)
Nashville	Davidson (TN)
New Orleans	Jefferson (LA), Orleans (LA), St. Charles (LA)
New York	Fairfield (CT), New Haven (CT), Bergen (NJ), Essex (NJ), Hudson (NJ), Hunterdon (NJ), Middlesex (NJ), Monmouth (NJ), Morris (NJ), Ocean (NJ), Passaic (NJ), Somerset (NJ), Union (NJ), Bronx (NY), Kings (NY), Nassau (NY), New York (NY), Putnam (NY), Queens (NY), Richmond (NY), Rockland (NY), Suffolk (NY), Westchester (NY)
Philadelphia	New Castle (DE), Burlington (NJ), Camden (NJ), Gloucester (NJ), Mercer (NJ), Salem (NJ), Bucks (PA), Chester (PA), Delaware (PA), Montgomery (PA), Philadelphia (PA)
Phoenix	Maricopa (AZ)
Portland	Clackamas (OR), Multnomah (OR), Washington (OR), Clark (WA)
Richmond	Chesterfield (VA), Henrico (VA), Richmond (VA)
Salt Lake City	Salt Lake (UT)
San Antonio	Bexar (TX)
San Diego	San Diego (CA)
Seattle	King (WA), Pierce (WA), Snohomish (WA)
St. Louis	Madison (IL), St. Clair (IL), St. Louis (MO), St. Louis (MO)
Tampa	Hillsborough (FL), Pinellas (FL)
Tucson	Pima (AZ)
Virginia Beach	York (VA), Chesapeake (VA), Hampton (VA), Newport News (VA), Norfolk (VA), Poquoson (VA), Portsmouth (VA), Suffolk (VA), Virginia Beach (VA)
Washington, DC	District of Columbia (DC), Anne Arundel (MD), Baltimore (MD), Howard (MD), Montgomery (MD), Prince George's (MD), Baltimore (MD), Arlington (VA), Fairfax (VA), Alexandria (VA), Fairfax (VA), Falls Church (VA)

Table S2. Air Quality System (AQS) monitoring sites selected to calculate the average NO₂ concentrations for each urban area.

Urban area	State	County	Site No.	POC ^a	Latitude	Longitude
Atlanta	GA	Rockdale	1	1	33.591	-84.065
Boston	MA	Essex	2006	1	42.475	-70.971
	MA	Suffolk	2	1	42.349	-71.097
	MA	Suffolk	40	1	42.340	-71.038
	MA	Suffolk	42	1	42.330	-71.083
	MA	Suffolk	41	1	42.317	-70.968
	MA	Norfolk	3003	1	42.212	-71.114
Charlotte	NC	Mecklenburg	41	1	35.240	-80.786
Chicago	IL	Cook	4201	1	42.140	-87.799
	IL	Cook	3103	1	41.965	-87.876
	IL	Cook	63	1	41.878	-87.635
	IL	Cook	4002	1	41.855	-87.752
	IL	Cook	76	1	41.751	-87.713
	IN	Lake	22	1	41.607	-87.305
Cincinnati	OH	Hamilton	40	1	39.129	-84.504
Dallas	TX	Tarrant	3009	1	32.984	-97.064
	TX	Tarrant	1002	1	32.806	-97.357
	TX	Dallas	75	1	32.919	-96.808
	TX	Dallas	69	2	32.820	-96.860
	TX	Dallas	87	1	32.676	-96.872
	TX	Tarrant	3011	1	32.656	-97.089
Denver	CO	Denver	2	1	39.751	-104.988
Detroit	MI	Wayne	19	2	42.431	-83.000
El Paso	TX	El Paso	55	1	31.747	-106.403
	TX	El Paso	44	1	31.766	-106.455
	TX	El Paso	37	1	31.768	-106.501
	NM	Dona Ana	21	1	31.796	-106.584
	NM	Dona Ana	22	1	31.788	-106.683
	TX	Harris	24	1	29.901	-95.326
Houston	TX	Harris	47	1	29.835	-95.489
	TX	Harris	55	1	29.696	-95.499
	TX	Harris	75	1	29.753	-95.350
	TX	Harris	26	2	29.803	-95.125
	TX	Harris	1034	1	29.768	-95.221
	TX	Harris	1035	1	29.734	-95.258
	TX	Harris	1015	1	29.762	-95.081
	TX	Harris	1039	1	29.670	-95.129
	IN	Marion	73	1	39.789	-86.061
Indianapolis	IN	Marion	73	1	39.789	-86.061
Jacksonville	FL	Duval	32	2	30.356	-81.635
Kansas City	KS	Wyandotte	21	1	39.117	-94.636
	MO	Jackson	34	1	39.105	-94.571
Las Vegas	NV	Clark	2002	1	36.191	-115.123
Los Angeles	CA	Los Angeles	6012	1	34.383	-118.528
	CA	Los Angeles	1201	2	34.199	-118.533
	CA	Los Angeles	1002	2	34.176	-118.317
	CA	Los Angeles	113	1	34.051	-118.456
	CA	Los Angeles	5005	1	33.951	-118.430
	CA	Los Angeles	2005	1	34.133	-118.127
	CA	Los Angeles	1103	1	34.067	-118.227
	CA	Los Angeles	4002	2	33.824	-118.189
	CA	Los Angeles	2	2	34.137	-117.924
	CA	Los Angeles	16	1	34.144	-117.850
	CA	Los Angeles	1701	2	34.067	-117.751
	CA	Orange	5001	2	33.925	-117.953

Urban area	State	County	Site No.	POC ^a	Latitude	Longitude	
Los Angeles	CA	Orange	7	5	33.831	-117.938	
	CA	Orange	1003	1	33.675	-117.926	
	CA	San Bernardino	1004	2	34.104	-117.629	
	CA	San Bernardino	2002	1	34.100	-117.492	
	CA	San Bernardino	9004	1	34.107	-117.274	
	CA	Riverside	8001	2	34.000	-117.416	
	CA	Ventura	2002	1	34.276	-118.685	
Louisville	KY	Jefferson	67	1	38.229	-85.655	
	KY	Jefferson	1021	2	38.264	-85.710	
Memphis	AR	Crittenden	5	1	35.197	-90.193	
Miami	FL	Broward	8002	1	26.087	-80.111	
	FL	Miami-Dade	4002	2	25.798	-80.210	
	FL	Miami-Dade	27	1	25.733	-80.162	
Minneapolis	MN	Anoka	1002	1	45.138	-93.208	
	MN	Dakota	423	1	44.776	-93.063	
Nashville	TN	Davidson	11	1	36.205	-86.745	
New Orleans	LA	Jefferson	1001	1	30.044	-90.275	
New York	NJ	Middlesex	11	1	40.462	-74.429	
	NJ	Essex	1003	1	40.758	-74.201	
	NJ	Union	4	2	40.641	-74.208	
	NJ	Hudson	6	1	40.670	-74.126	
	NY	Bronx	110	1	40.816	-73.902	
	NY	Queens	124	1	40.736	-73.822	
	CT	Fairfield	9003	1	41.118	-73.337	
	CT	New Haven	27	1	41.301	-72.903	
	Philadelphia	PA	Bucks	12	1	40.107	-74.882
		PA	Philadelphia	4	3	40.009	-75.098
PA		Philadelphia	47	1	39.945	-75.165	
PA		Delaware	2	1	39.836	-75.373	
DE		New Castle	2004	1	39.739	-75.558	
Phoenix	AZ	Maricopa	9997	1	33.504	-112.096	
	AZ	Maricopa	19	1	33.484	-112.143	
	AZ	Maricopa	3010	1	33.461	-112.117	
	AZ	Maricopa	3002	6	33.458	-112.046	
Portland	OR	Multnomah	80	1	45.497	-122.603	
Richmond	VA	Richmond City	24	1	37.563	-77.465	
	VA	Charles	2	1	37.344	-77.259	
Salt Lake City	UT	Salt Lake	3006	1	40.736	-111.872	
	UT	Davis	4	1	40.903	-111.884	
San Antonio	TX	Bexar	59	1	29.275	-98.312	
San Diego	CA	San Diego	3	1	32.791	-116.942	
	CA	San Diego	1006	1	32.842	-116.768	
	CA	San Diego	1010	1	32.701	-117.150	
	CA	San Diego	1	1	32.631	-117.059	
	CA	San Diego	2007	1	32.552	-116.938	
Seattle	WA	King	80	1	47.568	-122.309	
St. Louis	IL	Saint Clair	10	2	38.612	-90.160	
Tampa	FL	Hillsborough	1065	1	27.892	-82.539	
	FL	Pinellas	18	1	27.786	-82.740	
Tucson	AZ	Pima	1011	1	32.204	-110.878	
	AZ	Pima	1028	1	32.295	-110.982	
Virginia Beach	VA	Norfolk City	24	1	36.856	-76.301	
Washington, DC	MD	Baltimore (City)	40	1	39.298	-76.605	
	MD	Baltimore	3001	2	39.311	-76.474	
	DC	District of Columbia	43	1	38.922	-77.013	
	VA	Arlington	20	1	38.858	-77.059	

^a Parameter Occurrence Code used to distinguish different instruments that measure the same parameter at the same site.